

Remarks

Claims 1-5, 7, 8, 10, 11, and 14-17 are now of record in this application. Claims 1, 7 and 14 have been amended, claim 13 has been cancelled, and new claims 15-7 have been added.

Support for the amendments to the claims may be found in the original disclosure. Specifically, support for the amendments to the claims and new claims 15-7, drawn to the specific crop materials being ensiled, may be found in the specification at page 6, paragraph no. 0013, lines 1-3.

Rejection Under 35 U.S.C. 102

Claims 1, 2, 5, 13 and 14 have been rejected under 35 U.S.C. 102(b) as being anticipated by Hatfield (2002). The Examiner has taken the position that Hatfield discloses a method for preserving forages. Applicants respectfully disagree.

Hatfield (2002) is drawn to a study of the polyphenol oxidase (PPO) present in red clover and its correlation with reduced proteolysis in red clover. The abstract discloses that the endogenous PPO and o-diphenol present in red clover inhibit protein degradation in red clover extracts (penultimate sentence).

The independent claims are drawn to a method for reducing the proteolysis of ensiled crops (also known as silage).

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Independent claim 1 is limited to a method comprising contacting a crop material to be ensilaged with an o-diphenol compound and a polyphenol oxidase at the time of ensilaging (page 5, paragraph no. 0012, lines 1-5, and page 10, paragraph no. 0022, lines 1-7). The o-diphenol compound and a polyphenol oxidase are provided in an amount effective to reduce the degree of proteolysis of the crop material (page 6, paragraph no. 0013, lines 5-7, and page 13, paragraph no. 0027, lines 1-5). Crop materials that may be treated include alfalfa, corn, wheat, triticale, rye, barley, oat, pea, sorghum, sudan, millet, and lentil (page 6, paragraph no. 0013, lines 1-3). This is not disclosed or suggested by the prior art.

As noted above, Hatfield relates to the endogenous system of PPO and o-diphenol naturally present in red clover, and how this endogenous PPO and o-diphenol act to inhibit protein degradation in red clover extracts. The abstract does not disclose or suggest treating crop materials with PPO and o-diphenol as in claims 1 and 14, or treating a PPO transformed crop with o-diphenol as in claim 7, much less crops other than red clover as set forth in claims 1, 7, and 14.

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Rejection Under 35 U.S.C. 103

Claims 3, 4, 7, 8, 10, and 11 have been rejected under 35 U.S.C. 103 as being unpatentable over Hatfield (2002) as applied to claims 1, 2, 5, 13 and 14, in view of Krutz. The Examiner has taken the position that Hatfield teaches the application of PPO to crops to be ensiled. The Examiner has further taken the position that it would have been obvious:

1. that the application of PPO onto crops to be ensiled yields PPO transformed crops;
2. to macerate the crops to shorten the drying period; and
3. to determine the most efficient application rate.

Applicants respectfully disagree.

Hatfield was described in the response to the §102 rejection above.

Krutz is drawn to an apparatus for macerating forage, such as hay. The apparatus includes a mower (flail intake 67) for cutting the plant, rotating rollers 17 and 18 for macerating the cut forage 22 as it is passed therebetween, and a conveyor 25 for discharging a mat of the macerated forage (Fig. 3).

The instant claimed invention was described in the response to the §102 rejection above.

Applicants submit that Krutz does nothing to alleviate the deficiencies in the disclosure of Hatfield. Krutz only relates to an apparatus for macerating forage. It does not disclose any system for inhibiting protein degradation in plants, much less

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using PPO and an o-diphenol. As noted in the response to the §102 rejection, Hatfield only discloses that the endogenous PPO and o-diphenol naturally present in red clover function to inhibit protein degradation in extracts of the plant. The abstract does not disclose or suggest treating crop materials with PPO and o-diphenol as in claims 1 and 14, or treating a PPO-transformed crop with o-diphenol as in claim 7. Moreover, Hatfield does not disclose or suggest treating crops other than red clover. Applicants respectfully submit that a practitioner of ordinary skill in the art could not reasonably predict that the PPO/o-diphenol system which is naturally present in red clover would be effective as a treatment to inhibit proteolysis in other plants which lack this system.

It is well established that obviousness requires that the prior art provide at least some predictability or a reasonable expectation of success of the claimed process. See *In re Gangadharam* (CAFC 1989) 13 USPQ2d 1568, *In re Whiton* (CCPA 1970) 164 USPQ 455, and *In re Rinehart* (CCPA 1976) 189 USPQ 143. Contrary to the Examiner's conclusion, a practitioner skilled in the art could not predict or expect with any reasonable degree of certainty that the addition of PPO and o-diphenol to plants other than red clover would confer the same inhibition of protein degradation. Higher plants such as those claimed are

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exceptionally complex organisms with a myriad of inter-related biological systems therein. Simply because the prior art discloses that PPO and o-diphenol constitute a natural system inhibiting proteolysis in a single plant species, the practitioner skilled in the art could not reasonably predict that they would be effective as a treatment for all plants. With respect to claim 7, Applicants respectfully submit that the Examiner's position that the application of PPO onto crops to be ensiled yields PPO transformed crops is in error. The claimed polyphenol oxidase transformed crops refer to transgenic plants transformed with the gene for PPO as described in paragraph no. 0021 on page 9 of the specification. However, Applicants readily acknowledge that the production of such PPO transformed plants has been previously described as noted in paragraph no. 0021.

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In view of the foregoing, Applicants respectfully submit that claims 1-5, 7, 8, 10, 11 and 14-17 distinguish over the prior art of record. Allowance thereof is respectfully requested.

Respectfully submitted,

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